ABSTRACT OF THE DISCLOSURE

An arrayed waveguide grating optical multiplexer/demultiplexer includes an arrayed waveguide connected to at least one first optical waveguide via a first slab waveguide. A plurality of second optical waveguides are connected to the arrayed waveguide via the second slab waveguide. A number (N_{ch}) of the plurality of second optical waveguides is determined to substantially satisfy the equation, $\Delta f_{fsr} = \Delta f_{ch} \cdot N_{ch}$. Δf_{fsr} is Free Spectral Range of the arrayed waveguide grating optical multiplexer/demultiplexer. Δf_{ch} is a frequency interval between frequencies of lights to be input to the arrayed waveguide grating optical multiplexer/demultiplexer for being multiplexed or lights to be output from the arrayed waveguide grating optical multiplexer/demultiplexer after being demultiplexed.

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